>> (Meeting is now being recorded).

>> Good morning and thank you for joining us for the November since. My name is Emily and I'm currently the technology coordinator at the national network of libraries and medicine region. I know we have people joining us from all over and I thank you for coming to this presentation. We are lucky enough to have our presenter from Reno this morning. I thank you for joining us on Pacific coast time and just a little introduction about our presenter. She's currently the engineering librarian at the University of Nevada engineering library. They push the boundaries of academic library by encouraging the hacker mentality in the library with resources and programming. The library offers a community hacker space and collective and encourage research. She served as a life and signs librarian and served with the academic libraries and I want to thank you again for joining us and I'll turn it over to our presenter.

>> Tara, are you there? Test. Test. Test. Test. Test. Test.

>> Today I'm going to talk about making an innovation in libraries and academic libraries in particular. Innovations we've seen in health sciences as well and we we believe this should be happening and not just in our library but everywhere. An interesting side note on my directory slide here you notice we have this awesomeness in progress please do not touch. This is a 3D printed sign which I'll talk about later created. And when we first asked him to create a sign that could hook on the 3D printer so just no one would touch the buttons while it was running to interrupt a job. His first reaction was do not touch. Here's this student who works in this innovative crazy nontraditional library but he has a preconceived notions of what a library should be and the language we should use and we said, Dwight, it looks pretty, but let's spin it a little positive. We want people to be engaged with everything that goes on. Just don't want them to tap a button while something's running. So a little background: We're at the engineering library at the university Nevada Reno.

We are the institution for the state. We have about 18,000 students on campus. That number is rapidly growing and about six thousand of those are served by by de la mar mare. We have four librarians the two of them are in the here right now. We just like to share that we, like you, are completely understaffed but we find way to make it work. We're a smaller library on campus. We have about 22,000 square feet. We are one of three campus libraries. We actually have a small medical school library on the far end of campus. We're on the south end and in the middle we have a big beautiful knowledge center that serves the rest of the disciplines on campus.

So, just want to go over some of the officer that we have at DeLaMare and we can talk about particular uses and if you have questions about how students are utilizing any of these resources please ask away in the chatbox. Up in the upper left hand corner we have an Oculus Rift. We check out two headsets. This is virtual reality and on the right you can see we have the Google Glass so we check out a couple pair to Google Glass to any faculty or staff. We want to inspire creativity and think outside of the box and think of new applications for these devices. I'll talk a little bit about the Google Glass later as well. We also have Lego Mindstorm kits available for check out and one of the easiest things you can do to start creating an innovative and maker space atmosphere is white board wall paint. This will create an engaging and collaborative area within your library.

We also have some more high tech items. Oops, I'm going to back up there. Sorry. There we go. In the upper left hand corner you can see an example of a, oh, okay, in the left-hand corner you can see a 3D scanner. I'll also talk about how we acquired those and why. A little bit later.

In the middle you can see one of our 3D printers and I know you already had a presentation strictly on 3D printing. It really inspires creativity and lets students go their own way. In the middle we have a you print and in to the right we have a plaster based 3D printer that's been bought out by another company since and we have a laser cutter in the bottom left-hand corner which has been surprisingly utilized constantly within our library. We'll talk about that too. We also have -- you can see the gentleman with the PCB milling machine. It's mainly for circuit board prototyping. We do no have an available one in Reno at all and we have one on order. We're really excited to share that with the greater Reno

community. We are a public institution so the community is more than able to come in and utilize our resources.

On this page I just wanted to show some of the smaller cheaper lendables that we have in the library. You can see raspberry pis. MaKey MaKey kits and little bits. Those four items are all basic -- people started with coding and circuitry. They're great production pieces and we also have basic tools like soldering irons and all sorts of things. A Geiger counter because we never turn down a gift and a button maker and if you do not know already a button maker will be the best 200 dollars you ever spent at least your students will think so. It's great for clubs and for a finals stress relief. We also host a lot of workshops. On this page I have a lot of examples. On the top page we held the day to celebrate the -- and that was one of the engineering fraternities came to us and said we want to do this and they know we have tons of these kits and support doing this so we had that on the Saturday at the library. Bottom left is an example, something kind of exciting. We are a science and engineering library but one of the business clubs came to us and asked if they could hold their design orientated workshops within the library. We support this type of thinking and there was design your own wallets and backpacks, those sorts of things. People are always surprised that we check out lock picking kits. And have workshops. It's not illegal. I promise and the kids know that locks are like noses. You only pick your own and the workshop is just reverse engineering and the kids learn a lock is just like a puzzle and it drives them to build better locks. These kids once they realize how things work they start thinking about how they make them better and it's really exciting. Hackathon as well and we -- looking for more partners but we went international and did a joint hackathon with another university in Australia. So a question we get a lot is this is great but why is this in libraries and especially academic libraries and I have a lot of reasons. One of the ones I believe most strongly is that this type of activity that's happening in DeLaMare library and other libraries that are supporting innovation and making help us build those sometimes lofty missions and values. I just happen to look at a couple, a few here, I think I have five, websites for academic libraries and grand some snippets of their mission statements. None of these libraries had maker space within the library so you can see things like innovation, creative learning spaces and fostering learning environment. We speak to provide -- these are things that help you achieve and be able to provide those truly transformative experiences for your students. Maker

space is an innovation hub they also help us teach student literacy. We understand the importance of information literacy and we know for kids to be truly successful after they graduate from our university that they need other literacies to be -- and I'll talk about this a little bit later but we don't want students to just get a job. We want them to be crazy awesome successful. Literacies that we've been able to teach in our understaffed library are digital media literacy, computational literacy and tactile literacy. Just some examples of digital and media literacy. We have a laser cutter and because of that we weren't sure how it was going to be utilized, but we got it in here and on the right-hand side you can see the bridges. We have an engineering class and all engineers have to take usually during their freshman year and they're building bridges and these students heard we have a laser cutter and they're bringing their wood and can do better designs rather than with glue and X-ACTO knives. We have a project that every freshman student has to create is a Styrofoam hovercraft and, yes, you will start Styrofoam on fire in a laser cutter and you figure out the settings and the students utilize it and the making and innovation and creative collaboration now it's all happening in our library which is exactly what we want to be happening.

You can also see someone using Photoshop and that's a pumpkin with a white walker on it. Our laser cutter has created digital literacy because our kits use high-end programming to create the designs they want to utilize on the laser cutter itself. So I also mentioned computational literacy and we have stories regarding this. On the bottom right hand corner if you haven't heard of little bits they're a phenomenal circuitry type toy and they're teaching circuitry without using wires. These are magnetic modules and they have dimmer switches to LED light to fans you can see some of them in that picture.

And not only are they great for young kids who are just beginning to learn how to do circuits, it's also great, we have found, in the college setting for very quick prototyping and brainstorming. And above that you can see we have a MaKey MaKey kit which is just a preprogrammed micro scroller. I'm talking about the blue item in the bottom left and -- so a student can move up from little bit to a MaKey MaKey and then you can start programming that micro controller itself and goes to an Arduino and after that you can tack AI full computer and none of these are cheap. And we moved through that progression. We checked out the MaKey MaKey kit and then a raspberry pie and now he's one of the star students in the robotics lab. We

are proud of him and we were able to contribute to that and we gave them the resources. He was not a computer science major so it's exciting to have stories like this.

And quite frankly I think this should be happening in academic libraries and any type of library because I want new students. I do not want students of getting a job. I think they deserve better than that and we're doing a great disservice to our students if we're not developing them to become innovative and passionate leaders. I know each student who walks through our library has that potential. It's our job to tell them they're awesome and we'll do everything in our power to become innovative and passionate leaders. By providing these services goes a long way to accomplish that goal. So how does it happen? That's usually the other question we get. We get a lot of oh, that could never work in our library and we know but it takes a new type of librarian. Both Kirsty and I have have worked in other libraries, more traditional library settings and have found when moving into this type of environment we're much less of an instructor or that information guide, right, through the waters of information. And we really do think of ourselves more as coaches and mentors and coconspirators if you will. These students know then come to us and not be afraid to ask a question or say I want to build a robot that shoots Nerf guns at my brother, and we say that's awesome and that always happens outside of the classroom this learning. So this new skill we think librarians have to have is you really have to be mentor. You need to get past this kind of professional facade that some of us put up. You have to be a connector. I think one of the main roles we see ourselves as connecting to the campus. We have great connections with EDAWN which is our local economic development organization that serves northern Nevada.

And they work closely with us and we know we can send things to them. We can also say hey, that's a great project and I know somebody in anthropology is working on something really cool too I think you should meet up and it's our job to connect those students and faculties. As librarians we want the library to be that kitchen in the house party. The place where mixing happens. The place where everybody ultimately ends up and starts talking about their ideas and possible collaborations. Unfortunately, it does take being on all the time. Be beyond the 9-5. Our job is the best job on the planet. It's also extremely draining. It's absolutely worth it. We do not have offices. In fact we were scrambling this afternoon to find a room to give this webinar and I'll talk about that a little bit too. You have to be

energized by chaos. Anybody who has stepped foot into a maker space realizes that it's far more chaotic than organized and you need to be an active participant. You cannot put a 3D printer on a table and expect a maker space to happen. We have to be active participants engaging and encouraging those students. You have to make friends with IT. I think a lot of the things we are doing are kind of scary not only to librarians but to traditional IT as well, and we do have the potential to bring down entire networks with the kids' work so always express why you're doing this. The versus majority who work in IT work in a place like our libraries. We say you have to get comfortable with technology. This is a real conversation. Tod if you're not familiar with him I encourage you to look at him I once said I think I broke the laser cutter and his response is oh, splendid, now you get to learn how to fix it and Christy is signalling to me that this has happened to her several times. This is new technology not normally supported by IT so it's a lot of getting dirty and hands on with the technology and really it's just the change in priorities. You know, everyday instead of having a to-do list we come into work and think how can I make the biggest impact today on the students, whoever your patrons might be. It's really not about to-do list and it may be sitting down at my desk and hunkering down on my grant proposal might be the best thing for my students and another day it could be on the floor with the laser printers but as soon as you change that look you'll know. The first step I did mention you have to get out of your offices if you want making to really happen we have to break down walls I'm in the upper left-hand corner with the arrow pointing to me is my desk and Eric in the red sweatshirt is pointing to one of the 3D printers. To do is on the third floor. Our desk are just out in the open and because of that we have become a deep part of our community. Students walk up to us all the time. They know who we are. We don't hide behind offices and we're approachable. They come to us with questions all the time and that's not really maker related but about changing the environment to this maker and innovative space where people feel comfortable bouncing ideas off of each other and asking for help and there are a couple of quotes that we live by. At DeLaMare as well. I love this Albert Einstein quote. We need to focus less on spaces and more on learning conditions and creating those conditions really means knowing your patrons and we always say things like that but let's make sure we get their individual input. You can see we have one of your students, jazzy, working on one of our Wacom tablets. We've had them for a few years and they were greatly underutilized. No one was

using these and I approached Jasmine and I said what would you do with this and she said those tablets are great but it's only useful if adobe creative suite was on there so I went to IT and explained to them if we want these utilized let's get the Photoshop program and programs that utilize this I would not have thought of that on my own.

So I'm glad that I asked Jasmine and now those lab lets are heavily used. On the bottom left-hand corner is another machine. We went to our computer science kids we know and we'd hop on a computer and say, hey, would you mind looking at a couple of these models and telling us which one you'd like to use more. I don't care if the machine is 26,000 dollars if the students aren't going to use it there's no point in having it. Good I included a picture of Chrissy. Chrissy, who you've been chatting to. She's laughing hysterically is on the right-hand side and on the left is Will the gentleman I told you about that moved from the MaKey kit to the robotics lab which is where we took a picture of him and Chrissy on the right-hand side I talk about how -- always allow student to have their passion but she built her first blinking light this year and she feels substantially more comfortable tracking these electronic problems but it's very everybody for any disciplines for any ages. And, again, Einstein talked about those conditions for learning and I think when we started reimagining our space we started thinking how can we create conditions for learning and collaboration and creativity and it was about brainstorming all the types of activities that we actually want to see happening in a library.

Studying is great and I love that kids love some of the comfy chairs and frankly we need to do more than that and we need to provide the students with a space where they can truly excel. Just some examples of things that happen in the library and some of our partners in campus. On the top left there's a student working on the Styrofoam photograph. It is levitating in that photograph. In the bottom we have a students truly engaged with the laser cutter and you can see that little boy there was actually laser cutting a pumpkin he was one of our library board member's kids and as soon as he started laser cutting this pumpkin all these college kids came over to talk to him about it. It was a great experience for all involved there and on the right you can see Baxter one of the computer science program's robots and we went over there and in the back you can see one of our technical services librarians and one thing we thought about is how can we engage other librarians to making and innovation because it should be happening everywhere so we actually asked

Kate, you are usually pretty interested in this so we brought them down to the computer science building next door and the faculty were extremely gracious and showed us around. Those robots also sometimes make appearances in the library. Having robots in the library should be the ultimate goal and it's pretty great. Another way -- another quote that we live by is nine tenth of education is encouragement and this is regardless of discipline, age, I also like to say that Tod was maybe more open-minded but Chrissy and I are both female librarians. We have in the left-hand corner the women in computer science engineering club and we do tons of outreach with students. You can see me on the bottom right showing off the Google Glass to the future stem type kids from a local middle school I believe. We do tons and tons of outreach. The events are happening of hours. That's what we're talking about beyond 9-5 but if you give students, kids, people in general the tools to excel they L.

On the bottom you can see I'm on the far left. Eric is in the red shirt. All four librarians after a long day of work went and did outreach programings. I don't think we've ever said no to someone asking us to do an outreach event. On the top left you can see 3D scanners. On the right it's an outcome of me 3D scanning one of the students. You can imagine the medical applications that 3D scanning at this life of a level can have and we'll talk about that a little bit too. One of the things that we have found the most, again, this is so much less about providing certain services and certain pieces of equipment it's about engaging. This is Tod in every single one of these pictures and he's the perfect example of being genuine and interested to the point where we feel absolutely comfortable walking to every student in the library saying hey, that looks awesome, what are you doing and it's working. It's working crazy well. We have students leaving our library with expert 3D modeling skills. I have multiple students work on patent applications. We've had probably hundreds of apps created in our hackathons and we have businesses coming out of this library. EDON said they have more businesses coming out of our library than anything else in Nevada. We're doing something right I don't know what it is but I'm grateful for it. Our students are leaving with a lot of tactile knowledge they would not have gotten. Most learning we know happens outside of the classroom and we're happy these students are coming here and getting all of these additional skills. A lot of people wonder how you get these pieces of equipment. It should not come out of your budget. A couple of the collaborations we made actually those hand held scanners which together came about to 40,000 dollars was with the psychology department.

Some researchers actually interested in neuroscience so we had two psychology professors write a grant application for high-end 3D scanners. What they're interested in is how much of an object do we have to see before our brain knows what it is. The idea was they wanted 3D models of various things in various states of being. If that makes sense. Part of a door handle. And then even the full door handle and someone will be lying in an MRI machine. So they requested and they were granted these 3D scanners with the caveat that they must be stored in DeLaMare library so that everybody and anybody on campus can also utilize them and they've been massively popular. So that's one example. And kind of a medical research environment. We actually had a proposal for a maker space in our library and it was cosigned by 31 faculty members across campus in every single discipline. We have 3D printers and the laser cutter came from the engineering department, and our vice president of research and innovation. It's his job to do this. He's looking for great opportunities for students and faculty members. DeLaMare library doesn't even have its own budget line in the greater library system. It's about being creative with that funding. Quite frankly this will also bring your faculty back to the library and I think those of us in the sciences that our faculty were pushed away and they don't spend time with us. They figure they can get all their resources online but because of how we changed the library and there's students and grad students and their colleagues are coming in and experimenting with our new toys but they're not toys, they're tools the faculty are coming back and supporting what we're doing and they're getting benefit out of it as well. We have seen engineering, chemistry, physics, as well as several biology faculty and we're not technically the biology or the Health Sciences Library but we're getting those faculty members. Art has come and utilized our stuff. Psychology, anthropology. We could go on and on with stories about how these faculty are coming in and using our resources and teaching and research. Emily had also mentioned about driving innovation beyond the university. We are a state institution and I think a lot of medical libraries also this same care value that the good things that happen on our campuses should directly benefit the people of our communities. It should benefit the taxpayers. It should benefit those people who are in need. And we truly believe that at DeLaMare as well. We are open to the public. I mentioned EDAWN already. The generator and bridge wire those are local spaces that we've been able to hook up our students with so we can go to them and say, hey, we have these types of tools, you should go down and can

we send our students down here to utilize the tools that you have that we don't. We do a lot of collaboration with local school districts. We know that this next important step, yes, we can hit those kids that are 18-24-30 years old but how do we get those kids thinking about college in the first place. The collective. And a lot more. And I wanted to talk briefly about innovation and making in the medical field so here on campus we actually had a group from the north end of campus come down and 3D print their own design organ and tissue bath for research and he said these are perfect, and he can't believe how much money it saved him. When I hear things like that I think about how quickly this will push things along. We can print those out for about 23 bucks in a fashion that perfectly fittings your research needs. We also seen guide drones so -- having trouble talking. This is one of our computer science instructors on campus and he is working within the Google Glass and drones. We are one of the government's drone testing sites to use these application for those who are blind he uploads a map of a building and that Google Glass can see for the person who is blind and walk them around so there are some terribly interesting applications. 3D scanners, you can imagine how helpful they would be in orthopedic as well as reconstructive surgery, so I know you've seen a lot of 3D printed ears and noses and things of those sorts and even organs, but if we had the possibility to accurately 3D scan you can make exact replicas and that's pretty exciting. It also makes things extremely cheaper and much more efficient. Arduino and Raspberry Pis. You need to get them and utilize them. The Arduino project I included a link there. There's a sleep tracker that someone made with a 35 dollar Arduino. On the right-hand side that's an open source syringe pump made with a 30 dollar device called a Raspberry Pi. These are utilizing these inexpensive tools. If you're not familiar with maker nurse I hope you do.

Christy and I are extremely lucky to be in Reno and a short drive from the San Francisco Bay area and we went to the Maker Faire this year and this was developed from the MIT little device lab and it's a celebration of the maker spirit that nurses have had for decades if not centuries within our hospital systems. And so you can see here it's made by a maker nurse and there's tons of stories and they also, if I go to the next slide, they have some where they encourage innovation and what they need to make their innovation needs better you can see a couple from Texas, so if you are in the area I would encourage going to these sites and seeing what they're doing. It was one of the best presentations we went to and it was very

innovative and they also have a maker nurse create community now which is super exciting. So it's essentially a thing averse. But instead it's for open source hardware that will help your patients and your medical practice. I was scrolling through it last week, and it's really impressive to see all the different types of inventions really that nurses coming up with because, one, they either don't have the funds to get what they really wanted or, two, if they're forced to come up with something on the fly within a matter of hours or minutes and not days or waiting for someone else to design it for them. So really I'm going to start to wrap up here and say when cost is no longer roadblocks you'll be amazed by the innovation. Cost has come down with a lot of things and with availability when we imagine what we are as libraries when we provide what a professional might not have access to on their own but we can get and share with everyone and we can provide avenues to really amazing innovation and collaboration. So here's that original sign that that student built for that awesomeness and project and we say please do touch. This is the type of things we do want going on so if you have anymore questions I'd love to have them and if Chrissy has anything else to say I would love to have her add it and that's it.

>> Great, thank you so much for that wonderful presentation. I think you had some great stories and examples in there. I'm going to leave the room open and let people type chatbox questions if you have any there or if you'd like to you can use star six to unmute yourself to ask a question and we have the contact information there if up to contact her personally this has been a fantastic presentation. And before everyone goes I'm going to go ahead and go real quick to do a promotion I guess of what we'll be doing next month. I want to thank Tara again and just an amazing job and I know I have a lot of questions but I'll follow up off of the site so let us bring the slides to let people know about what's happening next month.

>> I see there's a question to talk about space issues about some of the equipment. Fire electrical upgrades. Tons of lessons learned. So -- and there are always conditions. We work a lot with our environmental team on campus and they come in and test the air quality above both of our 3D printers. They had to approve them and make sure they are safe. They are completely enclosed 3D printers so there was not problem with that however with something like a laser cutter, yes, we can say you absolutely cannot cut PVC. We don't within the to release absolute poisonous gas into the air however other materials are toxic so we had to invest the only way we can get a laser cutter was to invest in quite an expensive filtration system. That's

something that gets turned on all the time whenever the laser cutter is running regardless of what it's cutting. As far as -- I think that was about it. I will say electrical upgrades for your building we are in an historical building, one of the oldest on campus and you can imagine the electrical outlets were not configured to have things like multiple 3D printers on the same circuit so that's been an adventure and also getting something like a 220 volt in an old building is an uphill climb so I can definitely speak to that. As far as recommending for grant funding there are some extremely great opportunities out there IMLS is really look to support the maker movement in all types of libraries and museums. There's also the Knight Foundation which often utilizes a library-type perspective. The newspaper foundation and there's -- and there are several different types for both of those so those are the two we've been doing to also in your own campus make sure you, as librarians are applying for internal grants that have to do with teaching and learning. People don't often think of the library as eligible for those grants but if we can provide resource to the entire population I promise that administrators would like to give it to you instead of a single faculty in a silo. Again, the knight foundation have been amazing. Do we have any issues with noise? Not really.

You know, we always stressed that -- we kind of giggle. We're giggling a little bit. We stress we're not a quiet library and we're not. There's certainly students that prefer quiet spaces and we're just not that library. We have a completely open atrium all the way up through to the fourth floor and so in those cases, nothing can actually be that quiet. Is laser cutting when it's running it's pretty loud with that filtration system. People talk over it and it actually has not deterred people from hanging out and working individually on the computers or in the tables around it. It's actually engaged students to walk over and see what's going on and we check out head phones and that seem to meet their needs.

>> Chrissy wrote in there if it's quiet we think something is horrifically wrong and we run over.

>> Thanks for those questions and also we have a brief survey if you don't mind for anyone still on the call if you don't mind following that link to take it. And then this for next week so you have -- I'm sorry, next month, so you'll have an idea it's December the 17th and Naomi will be our presenter. She's soon to be a technology coordinator and presenting on LGBTQ community health information resources.

I wanted to thank you all for joining in it looks like we do have a recording and hopefully I will get that posted and thank you again for your questions and please be in touch if you have anything further and I think that's all we have. I'm going to wrap it up. I want to say thank you one more time but I have another little brief survey if you don't mind filling it out helps us to do our data for The National Library of Medicine. Thank you all for joining and thank you, Tara.

>> Thank you, and Chrissy, please, anybody feel free to contact us with any additional questions. We're more than happy to tell you about the lessons we've learned.

>> Sure. And -- I well I forgot to ask I try to always be organized if you are from the NLMN region we are working on additional options for the future that cover these topics. We're hoping to get that approved and look for announcements if we do coming soon.

>> Thank you, again, yes there was a question about the transcript of the presentation available I can make that available and the recording as well should also be online. Let me -- I'll type in the box here real quick and I'll share the link for the website where you'll be able to get hold of that with everything once everything's online and I'll also be sure we send out an e-mail for where you got the information from. This is the URL where you can find everything later on. Thank you, again, have a wonderful high school day week next week and enjoy the break. Thank you.

>> (End).